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Journey through the future
Connected cars and OEM outlook in India
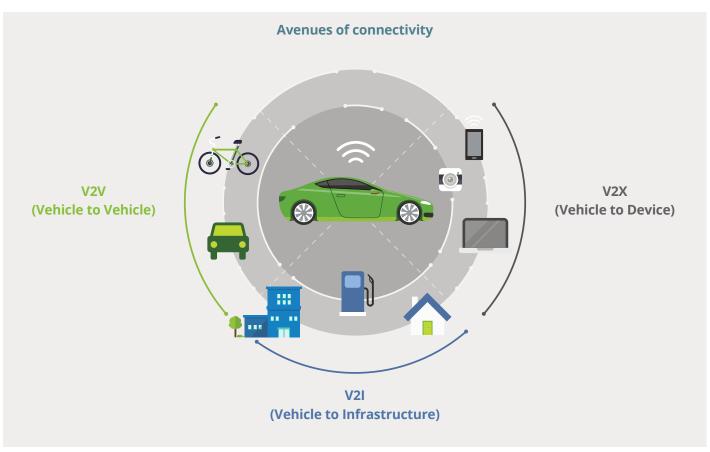
Introduction

Global drivers, technology players, and new-age digital partners are converging to realise greater value from connected vehicles. Through this report, we have explored connected cars through the Original Equipment Manufacturer (OEM) lens. In doing so, we have tried to explore the value that OEMs can create through connectivity and the implications for all stakeholders in the vehicle and driver ecosystem.

With over 520 million[1] internet subscribers, India is one of the largest and fastest growing markets for digital customers. By 2022, the number of internet users is expected to exceed 630 million[1]. So much so, that consumers are now demanding seamless online and offline experiences. The automotive industry's next evolution is also expected to be hinged on digitalisation. Traditionally, cars have been disconnected devices with the focus of OEMs on the product being sold. However, connected cars offer large volumes of data, pertaining to almost every aspect of the car and the driver. This data explosion, coupled with an increased matrix of connected devices and longer commutes could open up a plethora of possibilities for OEMs to create value for themselves and their customers.

Figure 1: Avenues of connectivity

Avenues of connectivity

V2V
(Vehicle to Vehicle)

V2X
(Vehicle to Device)

V2I
(Vehicle to Infrastructure)

In India, connected car technology is still at a nascent stage with a meagre 5 percent[2] penetration of infotainment systems and digital cockpits. Connectivity is largely restricted to smartphones and in-car infotainment devices. However, globally, connectivity penetration stands at 30 percent, while Japan leads at 90 percent[2]. As the current vehicle-to-smartphone connected technology becomes more symbiotic with the lifestyles of today, consumers are more likely to evaluate OEMs based on their experiences on smartphones, tablets, apps, and other connected devices. This is expected to pave the way for vehicle-to-vehicle (V2V), and vehicle-to-infrastructure (V2I) connectivity, thereby expanding the market even further.

With the evolution of the automotive industry landscape, OEMs will need to broaden their focus from their physical offerings to the value and customer experience they can provide through connectivity. Additionally, while designing connected car solutions, auto OEMs will also have to consider local geographical trends and market drivers.

Connected car features, which can be brought to the market, fall under areas such as safety and security, navigation, infotainment, convenience, maintenance, and remote control. In this report, we have focused primarily on the vehicle and the driver environment and not considered the manufacturing and supply-chain side of the sector.

Figure 2: Typical services

Area	V2V	V2I	V2X
Safety and security	• Intersection movement assistance • Emergency electronic brake • Do not pass		• Driver behaviour monitoring • E-call • Stolen vehicle locator • Stolen vehicle control
Navigation	• Unsafe road ahead assistance	• Parking management • Smart home services • Smart office services • Multimodal route planning	• Local and POI search
Infotainment			• Music/news/stocks/sports/weather • In-vehicle advertising • Gamification
Convenience		• Remote diagnostics • Eco-friendly drive • In-vehicle payment	• Parking assistance • Biometric co-sharing
Maintenance			• Predictive maintenance • Insurance telematics • Product optimisation • Fleet management
Remote control			• Vehicle locator • Remote vehicle control/monitoring

Figure 3: Key market drivers

Market drivers

Expectations

Increase in connectivity and internet consumption

Consumers expect more digital services, both inside and outside the car

Increase in commute time

Consumers are willing finish up a lot of activities while they are in the car

Cultural differences and changing needs across geographies

Driving needs, patterns, and customer expectations differ across geographies

Rapid growth in organised pre-owned car market

Consumers expect more transparency in the pricing of pre-owned cars or in the market value of their current cars

Exponential surge in time spent on mobile devices

Convergence of applications and command interface in mobile devices for an increasing number of use cases
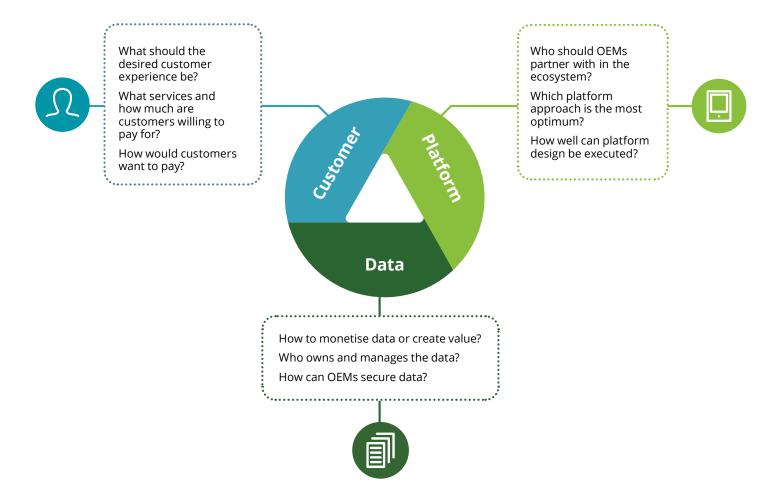
Proliferation in data generation

Consumers willing to share their personal data in exchange for better services, which can then enable ecosystem players to collaborate

Key considerations for OEMs

With connected cars gradually becoming ubiquitous, OEMs will have to consider a few fundamental questions from three perspectives—customer, platform, and data.

Figure 4: Key considerations for OEMs

What should the desired customer experience be?

What services and how much are customers willing to pay for?

How would customers want to pay?

Who should OEMs partner with in the ecosystem?

Which platform approach is the most optimum?

How well can platform design be executed?

How to monetise data or create value?

Who owns and manages the data?

How can OEMs secure data?

Customer

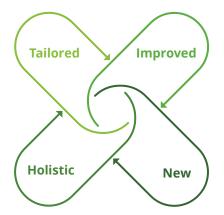**What should the desired customer experience be** ?

The complexity and relevance of today's customer experiences demand a clear understanding of all relevant touchpoints and possible journeys.

Technology is likely to transform customer experience in connected vehicles through four primary objectives—personalisation and customisation, enhanced value, consistency, and new experiences. OEMs will need to prioritise the combination of customer experiences that they intend to take to market.

Figure 5: Objectives of customer experience

Personalisation and customisation
Personalisation based on customers' usage and preferences

Tailored → **Improved**

Enhanced value
Enhance value with technological improvements in existing versions

Consistency
A holistic experience to the customer based on customer usage and experience
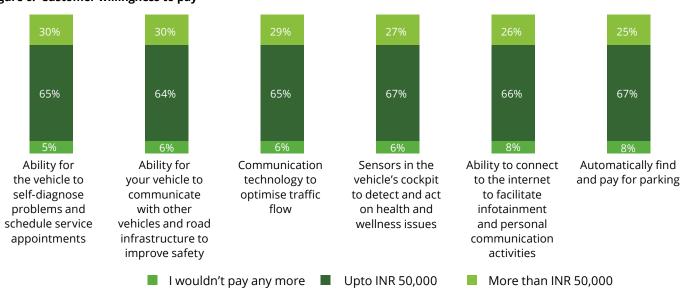
Holistic **New**

New experiences
New innovations for enhanced customer experience

What services are customers willing to pay for and how much ?

India is one of the few countries where the willingness to pay for advanced technologies is fairly promising. Deloitte's Global Automotive Customer Research for 2020[3] conveyed that two out of three Indians are willing to pay up to INR ~50,000 for connected technologies.

Figure 6: Customer willingness to pay

	Ability for the vehicle to self-diagnose problems and schedule service appointments	Ability for your vehicle to communicate with other vehicles and road infrastructure to improve safety	Communication technology to optimise traffic flow	Sensors in the vehicle's cockpit to detect and act on health and wellness issues	Ability to connect to the internet to facilitate infotainment and personal communication activities	Automatically find and pay for parking
More than INR 50,000	30%	30%	29%	27%	26%	25%
Upto INR 50,000	65%	64%	65%	67%	66%	67%
I wouldn't pay any more	5%	6%	6%	6%	8%	8%

■ I wouldn't pay any more ■ Upto INR 50,000 ■ More than INR 50,000

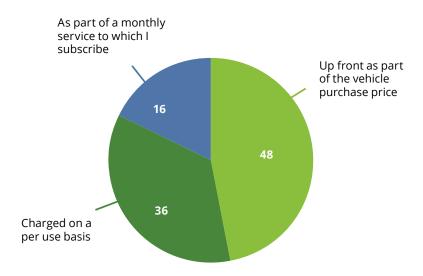Source: Deloitte 2019 Global Automotive Consumer Survey

How would customers want to pay for these added connaectivity features ?

Based on Deloitte research[4], nearly 48 percent respondents indicated a preference to pay this amount upfront, as part of the vehicle price, and nearly 36 percent preferred to be charged on a per-use basis.

This is supported by the fact that auto finance in India is a growing market, with upwards of 70 percent finance penetration[5]. People would prefer including all services as part of the car price upfront.

Figure 7: How would consumers prefer to pay for technologies

As part of a monthly service to which I subscribe

Up front as part of the vehicle purchase price

16

48

36

Charged on a per use basis
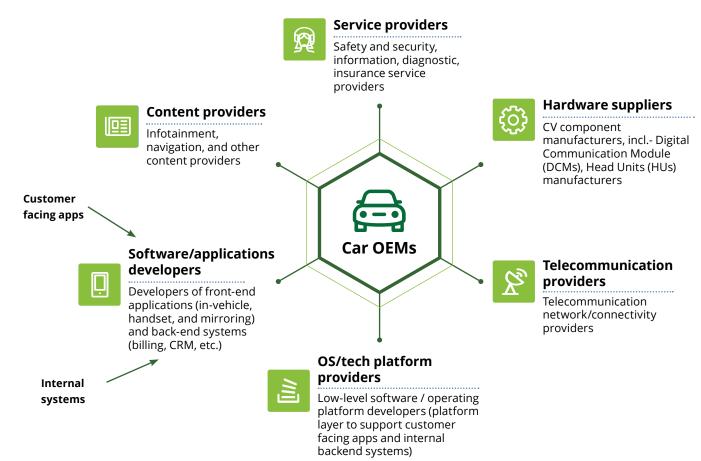
Platform

Who should OEMs partner with in the ecosystem ?

It is crucial for OEMs to forge the right partnerships while ensuring a minimum viable ecosystem. The range of partnerships has been described in the figure below:

Figure 8: Partners in the ecosystem

Service providers
Safety and security, information, diagnostic, insurance service providers

Content providers
Infotainment, navigation, and other content providers

Hardware suppliers
CV component manufacturers, incl.- Digital Communication Module (DCMs), Head Units (HUs) manufacturers

Customer facing apps

Car OEMs

Software/applications developers
Developers of front-end applications (in-vehicle, handset, and mirroring) and back-end systems (billing, CRM, etc.)

Telecommunication providers
Telecommunication network/connectivity providers

Internal systems

OS/tech platform providers
Low-level software / operating platform developers (platform layer to support customer facing apps and internal backend systems)

Which platform approach is the most optimum ?

a. After-market plug and play solution
These are "off-the shelf" solutions and can be fitted (factory-fitted or retro-fitted) into any car by users. Typically, these solutions provide GPS functionalities, along with the ability to collect data from the Controller Area Network (CAN) for basic car health checks. The use cases are enabled through an external smartphone app.

b. Telematics-based platform
Telematics is not a new technology but recent innovations and close coupling with cloud-based solutions has significantly improved the ecosystem. These solutions offer a certain degree of scalability and customisation to auto OEMs depending on the nature of the partnership. As switching costs are quite high, scale, customisation, and access to data may prove to be avenues for consideration.

c. Third-party SI-based platform
End-to-end services for connected cars are available from a few traditional Service Integrators (SIs) in the market. These SIs reduce time-to-market by bringing in experience and expertise while remaining largely product/platform agnostic. OEMs can take this approach for an end-to-end partner, and at the same time, start fast and build their internal capabilities while leveraging these partners.
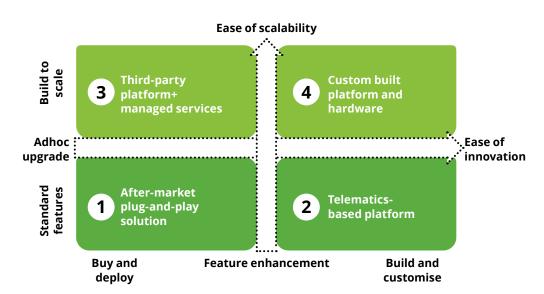
d. Custom-built platform
This seems to be the most preferred approach across mature OEMs. Internal capabilities are first established to build a customised platform that can cater to both short term and long term connected car solution requirements. Studies tell us that at least 72 percent drivers[6] in India across different age-segments are likely to put more trust on "built-in" connected vehicle features than "brought-in" capabilities.

Figure 9: Possible connected vehicle platform approaches

Extent to which the platform is scalable as more players and customers are onboarded

- Depends on several factors that may act as catalysts or deterrents, e.g., architecture, compatibility
- Depends on the kind of players involved and their ability to innovate continuously with the market

Extent to which innovation is possible across platforms with agility
- Depends on the control on the platform and the ability to act on customer insights with agility
- Platform ownership allows faster decision making and new feature deployment

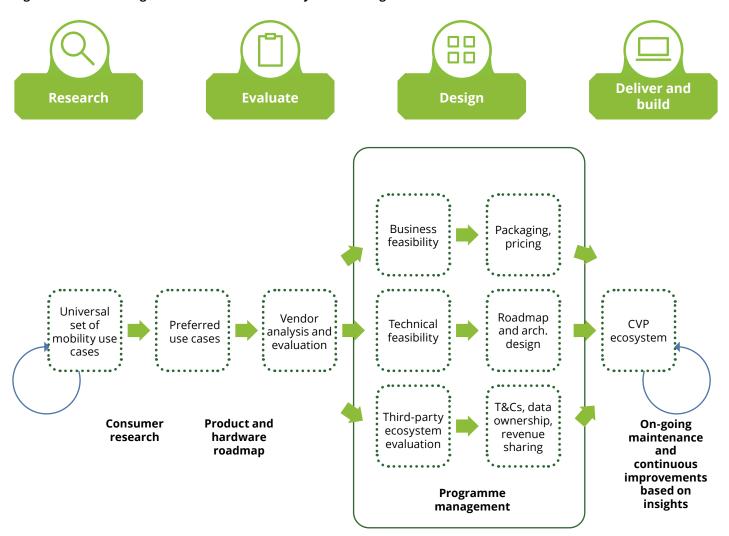**How well can platform design be executed** ?

a. Research

Local insights are likely to play a key role in shaping up region-specific strategies, while global market trends can enable core capability designs. The outcome of this phase will be the ability to draw out a possible set of features that might be relevant for capability design discussions.

b. Evaluation

A thorough assessment of the external ecosystem and alignment with a particular solution strategy and implementation partner is central. A key input for this stage is the internal product roadmap and hardware architecture, which will need alignment with the solution strategy.

Figure 10: The four stages of connected-vehicle ecosystem building

c. Design

Three separate but interlinked work streams can contribute to the design stage. Business teams need to package and position the offerings per market demands. Technical teams can run the solution development stream and bring various technology players on the same page. Marketing teams or in-house partner enablement teams could "hunt" for additional partnership opportunities in the market. This will create a holistic ecosystem, which can provide additional use cases and revenue streams on the platform.

d. Deliver and build

Relevant teams must be deployed for continuous support and enhancements once the ecosystem is live. The deliver-and-build stage should not be treated as a regular one-time software project. Technology platforms that are built on the philosophy of continuous improvement and with a focus on user experience have been seen to enjoy larger user adoption.

Data

How to monetise data or create value

Figure 11: Value drivers

Illustrative

Value drivers for connected vehicle-enabled services

Where to play (markets and customers)

New / Adjacent / Existing

Existing — Incremental — New

How to win (products and assets)

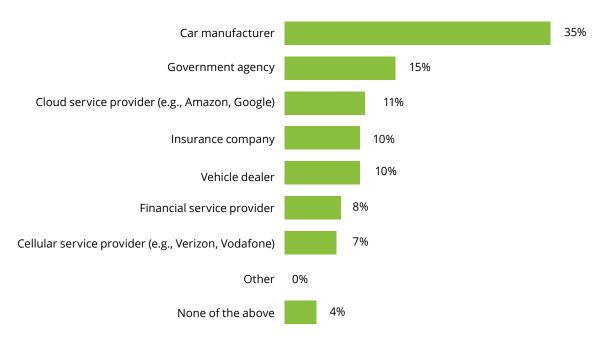| TRANSFORMATIONAL	New revenue source	Operational/ efficiency	Customer satisfaction
In vehicle-location-based advertising	✓		
Connectivity loyalty programme	✓	✓	✓
Warranty-over-the-air updates	✓		✓
Usage-based insurance	✓		✓
ADJACENT			
Dealer inventory management	✓	✓	✓
Warranty cost control savings	✓	✓	
Collision part sales	✓	✓	
Post-collision vehicle sales	✓	✓	
Quicker service fix		✓	✓
Increased dollars per RO	✓		
Selling data to targeted marketing companies	✓		
Customer revenue post trial period	✓		
CORE			
Vehicle information/ residual accuracy	✓		✓
Increased service loyalty	✓		✓
Service savings		✓	✓

OEMs need to devise their own strategies for the features or offering in focus. This is because all value that have been created may not result in revenue sources. Hence, it is imperative for OEMs to devise a value offering strategy to create a balance between new revenue sources while also increasing operational efficiencies and customer satisfaction.

Who owns and manages data and how can it be protected ?

Several cyber risks, including personal information loss, vehicle theft, critical safety feature manipulation, and vulnerable mobile application security arise from increased connectivity. As such, customer data must be managed and protected to ensure trust in the connected car ecosystem. Based on the Deloitte Global Automotive Survey7, 80 percent respondents did not mind sharing personal information with OEMs or third parties if significant value could be received. Nearly 40 percent respondents were also happy sharing sensor data related to vehicle status. However, they expressed concerns over sharing biometrics, location, and app data. Any company is likely to lose its reputation and the trust of its customers in the event of such data being compromised.

Figure 12: Consumer opinions on who they trust the most in managing data generated by their vehicle
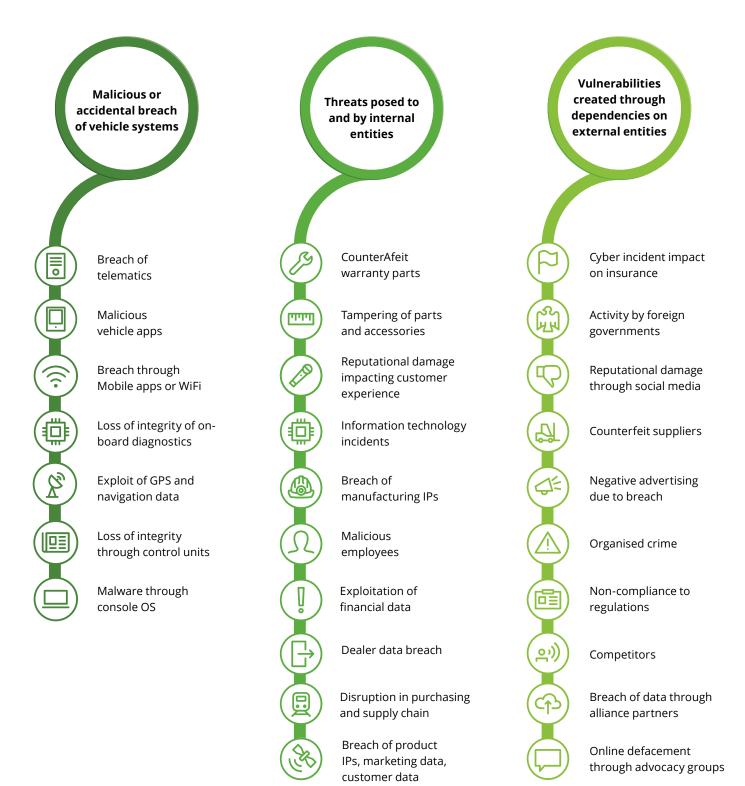
Car manufacturer	35%
Government agency	15%
Cloud service provider (e.g., Amazon, Google)	11%
Insurance company	10%
Vehicle dealer	10%
Financial service provider	8%
Cellular service provider (e.g., Verizon, Vodafone)	7%
Other	0%
None of the above	4%

How can OEMs secure data and mitigate relevant risks ?

It is important that info-security compliance is achieved through the propositions made. OEMs need to analyse and plan for the risks related to external entities, internal entities, or by malicious breaches of data systems. The range of key risks across the three key areas has been detailed in the figure below.

Figure 13: Types of risks

Malicious or accidental breach of vehicle systems

- Breach of telematics
- Malicious vehicle apps
- Breach through Mobile apps or WiFi
- Loss of integrity of on-board diagnostics
- Exploit of GPS and navigation data
- Loss of integrity through control units
- Malware through console OS

Threats posed to and by internal entities

- CounterAfeit warranty parts
- Tampering of parts and accessories
- Reputational damage impacting customer experience
- Information technology incidents
- Breach of manufacturing IPs
- Malicious employees
- Exploitation of financial data
- Dealer data breach
- Disruption in purchasing and supply chain
- Breach of product IPs, marketing data, customer data

Vulnerabilities created through dependencies on external entities

- Cyber incident impact on insurance
- Activity by foreign governments
- Reputational damage through social media
- Counterfeit suppliers
- Negative advertising due to breach
- Organised crime
- Non-compliance to regulations
- Competitors
- Breach of data through alliance partners
- Online defacement through advocacy groups

The way ahead

Over the next five years, connected cars are expected to change the way people perceive and use vehicles. By 2025, most cars in India are expected to be connected to users' homes and offices. Partnerships between OEMs and insurance companies (who may want to use the data from the car to design personalised insurance products) are likely to increase significantly. By 2025, fleet management companies are also expected to gamify the entire e-mobility space. Taxi companies could use driver behavioural data to rank and reward their drivers. These have the potential to enable cleaner and safer driving experiences.

For automotive players, the following considerations will help them realise their journey through a connected vehicle proposition:

- Connected Vehicle Platform (CVP) is not a software module or a standalone product. It is a platform that is enabled to provide differentiated value proposition to the customer through unique digital scenarios.

- Each use case and feature needs to be thoroughly researched before enabling it for the customer. There might be scenarios when a simple feature can provide the best experiences and drive adoption, while a negative user experience can harm the solution in its entirety.

- While auto OEMs will require initial handholding and technical support from external players, it is important for them to build self-sustainable capabilities and maintain these platforms in the future.

- The right go-to-market strategy, along with the timing of the launch may also have a bearing on the outcome. At times, a first-mover's advantage can play a key role for certain use cases while the collective market could drive adoption for the rest.

- Partnerships with multiple players in the ecosystem, including competitors and government institutions are likely to play a key role in scaling up capabilities. Being agile and able to enter and exit out of partnerships at the right time can be the key to success.

- While connected car capability is a differentiated value proposition today, it is expected to eventually become commoditised in the future. The key to maximising its full potential is to continuously innovate and improve **customer** experiences over time.

Endnotes

[1]   https://www.statista.com/statistics/255146/number-of-internet-users-in-india/

[2]   https://www.timesnownews.com/auto/features/article/connected-cars-in-india-only-5-per-cent-cars-offer-advanced-connectivity-features/457448

[3, 4, 7]   2020 Global Automotive Consumer Study (India and Global)

[5]   https://auto.economictimes.indiatimes.com/news/auto-finance/indias-new-pv-financing-market-to-double-to-rs-1600-billion-by-2020/57273665

[6]   https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/us-global-automotive-consumer-study-2019.pdf

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- Acceleration of the connected experience – Masa Hasegawa, Bruce Brown, Craig Giffi (Deloitte Report)

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Acknowledgements

Contact details

Rajeev Singh
Partner, Consulting
rpsingh@deloitte.com

Rajat Mahajan
Partner, Consulting
rajatm@deloitte.com

Abhrajit Ray
Partner, Consulting
abhrajitray@deloitte.com

Deloitte.